

**10/026,239****Patent**  
**IBM Docket No. FIS920010261US1**

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**In the United States Patent and Trademark Office****Date:** 2/24/05**In re Application of:** James N. Humenik, et al.**Filed:** 12/21/01**For:** PROCESS FOR ELECTROLYTICALLY CLEANING PASTE  
FROM A WORKPIECE**Serial Number:** 10/026,239**CONFIRMATION NO.:** 4441**Art Unit:** 1746**Examiner:** Markoff, Alexander**Appeal Brief ( Amended )**

Hon. Commissioner of Patents and Trademarks  
P. O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

On August 27, 2004, Appellants appealed to the Board of Patent Appeals and Interferences from the decision of the Primary Examiner finally rejecting claims 1 to 16. What follows is Appellants Appeal Brief as required by 37 CFR 41.37.

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International Business Machines Corporation, the assignee of the entire interest of the present application, is the real party in interest in this appeal.

**RELATED APPEALS AND INTERFERENCES:**

There are no related appeals and interferences.

**STATUS OF CLAIMS:**

Claims 1 to 16 are pending in this appeal and all of claims 1 to 16 have been finally rejected by the Examiner. No claims have been withdrawn or canceled. No claims are allowed.

**STATUS OF AMENDMENTS:**

No amendment was filed subsequent to the final rejection.

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**SUMMARY OF CLAIMED SUBJECT MATTER:**

The present invention pertains to a process for cleaning paste residue from screening masks and ancillary equipment which are used to screen conductive paste patterns on ceramic greensheets in the manufacture of multilayer ceramic substrates. As embodied in claim 1, an electrolytic process is proposed for removing the paste residue from the screening masks and ancillary equipment (collectively the workpiece). In the process, the workpiece is contacted with an aqueous solution containing TMAH (tetramethylammonium hydroxide) in an electrolytic cell. The concentration of the TMAH is preferably 0.2 to 2 weight percent. (Specification page 8, lines 10-20).

There is only one independent claim in the present application. For the convenience of the Board, it is reproduced herein as follows:

1. A process for cleaning paste residue from a workpiece comprising the steps of obtaining a workpiece having a paste residue thereon and electrolytically contacting the workpiece with an aqueous solution containing 0.2 to 2 weight percent TMAH.

The TMAH may be applied by spraying or immersion. Figure 1 (and specification page 8, lines 21-24 and page 9, lines 1-12) illustrates the process where the TMAH is sprayed 6 onto a workpiece 2 by spray apparatus 4. Figure 2 (and specification page 9, lines 13-16) illustrates the process where the workpiece 2 is immersed in the TMAH 14.

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As noted in the Examples, particularly the first set of examples and Table 1, those samples that were electrolytically cleaned, required dramatically less cleaning time than those samples that were just nonelectrolytically cleaned. These results were surprising and unexpected.

In a preferred embodiment of the present invention, the workpiece cleaning is enhanced by first contacting the workpiece with an aqueous solution of TMAH. Preferably, the TMAH is present in a concentration of 0.2 to 2 weight percent. In this process step, the TMAH is applied nonelectrolytically. (Specification page 11, lines 10-20). Thus, the effect of this process step as claimed in claim 7 when added to the subsequent process step of claim 1 is that the workpiece is first nonelectrolytically contacted with the TMAH and then the workpiece is electrolytically contacted with the TMAH. A portion of the paste residue would be removed by the nonelectrolytical cleaning step and the remainder of the paste residue would be removed by the electrolytical cleaning step.

The patentability of claim 7 will be argued separately and for the convenience of the Board is reproduced herein as follows:

7. The process of claim 1 further comprising the step, prior to the step of electrolytically contacting, of nonelectrolytically contacting the workpiece with an aqueous solution containing 0.2 to 2 weight percent TMAH.

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**GROUND OF REJECTION TO BE REVIEWED ON APPEAL:**

I. Claims 1 to 16 have been rejected by the Examiner under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 26 of Sachdev et al. U.S. Patent 6,280,527 (hereafter Sachdev '527) in view of Spring (Metal Cleaning). The Board of Patent Appeals and Interferences (hereafter "BPAI") will need to consider whether a rejection based on obviousness-type double patenting is proper when the prior (underlying) patent is not copending with the present application.

II. Claims 1 to 16 have been rejected by the Examiner under 35 USC §103(a) as being obvious over Sachdev '527 or Sachdev et al. U.S. Patent 6,277,799 (hereafter Sachdev '799) in view of Spring (Metal Cleaning).

**ARGUMENT:**

## I. Double Patenting Rejection:

Claims 1 to 16 have been rejected by the Examiner under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 26 of Sachdev '527 in view of Spring (Metal Cleaning).

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Obviousness-type double patenting is a judicially created doctrine that “ is a basis of rejection grounded in public policy and primarily intended to prevent prolongation of monopoly.” In re Braithwaite, 379 F.2d 594, 601; 154 USPQ 29, 34 (CCPA 1967). Obviousness-type double patenting rejects application claims that are obvious variants of the claims in a prior patent application or patent.

Early cases on the subject of obviousness-type double patenting appear to hold that the patent underlying the rejection is not prior art. One of the leading cases on obviousness-type double patenting, In re Zickendraht and Buehler, 319 F.2d 225; 138 USPQ 22 (CCPA 1963), states:

...The ground one finds stated in the cases is to the effect that the second invention must be patentable on its own account, over the invention *claimed* in the issued patent, jsut *as though* the invention so claimed were in the prior art, and tested (since 1953) by the unobviousness requirement of 35 U.S.C. 103. But since the patented invention is *not* prior art, the basis for denial is not a statutory basis;... Concurring opinion of Judge Rich at n.4.

In re Braithwaite, supra at n4. further states:

While analogous to the non-obviousness requirement of 35 U.S.C. 103, that section is not itself involved in double patenting rejections because the patent principally underlying the rejection is not prior art.

The court in In re Ornitz and English, 376 F.2d 330, 334; 153 USPQ 453, 457 (CCPA 1967) has opined:

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While “double patenting” rejections are made by the Patent Office when there is a common assignee and different inventors, this is done because the reference relied on is not “prior art” as explained in *Coleman*, supra, cited by appellants. Where the terms of section 102(c) are satisfied, as here, we think the Patent Office should apply the statutes as the basis for refusing a patent. Where it is possible to conduct the broader inquiry permitted by sections 102(e) and 103 because the references are “prior art”, it does not make sense to resort to the narrower inquiry which underlies a “double patenting” rejection.

The broad policy statement of the *In re Ornitz and English* court has been narrowed so that obviousness-type double patenting and 35 USC 102(e) (or 35 USC 102(e) / 103) rejections may be simultaneously made. *In re Fong, Brown, Wasley, Whitfield, and Miller*, 378 F.2d 977; 154 USPQ 25 (CCPA 1967).

A review of the cases on obviousness-type double patenting, although not an exhaustive review, seems to indicate that the double patenting rejections are typically made only in those situations where there has been a period of copendency between either two applications or an application and a patent. That a 35 USC 102(e) or 35 USC 102(e) /103 rejection can be made in addition to an obviousness-type double patenting rejection makes sense in view of the at least partial copendency of the applications or application and patent.

It is submitted that the obviousness-type double patenting rejection should not be extended to those situations where the underlying patent is clearly statutory prior art other than through 35 USC 102(e). This comports well with conventional jurisprudence where a court ought not extend a court-made doctrine any more than it has to so as to meet the original objectives of the doctrine,

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in this case avoiding the prolonging of the monopoly. Should a court unwisely extend the doctrine, the court would clearly be making law, a legislative function. And, there is no need to extend the obviousness-type double patenting doctrine in this instance where statutory prior art is available to the Examiner.

Accordingly, an obviousness-type double patenting rejection is not appropriate here . Sachdev '527 is prior art under 35 USC §102(a)/103 as it has an issue date (August 28, 2001 ) which is prior to Appellants' filing date (December 21, 2001). Any rejection made by the Examiner should be based on prior art and not obviousness-type double patenting. This position finds support in Section 804 of the Manual of Patent Examining Procedure (MPEP). As noted in Chart II-B in Section 804 of the MPEP, where the application and underlying patent are commonly owned with different inventive entities, as is the case here, the only rejections that the Examiner can make is an obviousness-type double patenting rejection and a 35 USC 102(e) / 103 rejection. There is no possibility for the Examiner to make a 35 USC 102(a) / 103 rejection. It is thus implicit in the policies of the PTO, and apparently reinforced by the case law, not to make an obviousness-type double patenting rejection when there is a basis for making a 35 USC 102 (a) / 103 rejection.

Accordingly, it is submitted that the obviousness-type double patenting rejection of claims 1 to 16 in the present application is erroneous and should be withdrawn.



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**II. The §103 Rejections:**

Claims 1 to 16 have been rejected by the Examiner under 35 USC §103(a) as being **obvious** over Sachdev '527 or Sachdev '799 in view of Spring (Metal Cleaning).

**A. Patentability of Claim 1**

It is believed that claim 1 is patentably distinguishable over Sachdev '527 or Sachdev '799 in view of Spring. Claim 1 is directed to cleaning paste residue from a workpiece by electrolytically contacting the workpiece with an aqueous solution of TMAH.

Sachdev '527 is directed to the nonelectrolytical cleaning of paste residues from a screening mask using a solution of TMAH. Sachdev '527 does not disclose the step of electrolytically contacting the workpiece with an aqueous solution of TMAH. Sachdev '799 similarly discloses an aqueous nonelectrolytical cleaning solution for removing paste residue from a screening mask wherein the aqueous cleaning solution can contain TMAH. Again, Sachdev '799 does not disclose the step of electrolytically contacting the workpiece with an aqueous solution of TMAH. The Examiner cites Spring for the proposition that it is conventional to electrolytically clean articles and therefore it would have been obvious to include electrolytic cleaning in the method of Sachdev '527 and Sachdev '799.

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More precisely, the Examiner states that:

It would have been obvious to an ordinary artisan at the time the invention was made to include electrolytic cleaning in the method of the Patents to enhance the cleaning and to reduce the fuming and thereby reduce the health hazard for operators with reasonable expectation of adequate results because Spring teaches that electrolytic cleaning was conventionally used for these purposes.

Appellants respectfully disagree with the Examiner's conclusion that it would have been obvious to combine Sachdev '527 or Sachdev '799 with Spring.

It is not enough that one may modify a reference in view of a second reference, but rather it is required that the second reference suggest modification of the first reference and not merely provide the capability of modifying the first reference.

An obviousness rejection cannot be based on the resort of the Examiner to various non-pertinent references and the combination of bits and pieces of the references in light of Applicants' teachings. An extensive discussion of the criteria to be applied in obviousness rulings is set forth in Aqua-Aerobic Systems Inc. v. Richards of Rockford Inc., 835 F.2d 871; 1 USPQ 2d 1945, 1956 (N.D. Ill. 1986). For example, the court has cited In re Gordon, 733 F.2d 900, 902; 221 USPQ 1125, 1127 (Fed. Cir. 1984), which states that

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The mere fact that the prior art could be modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.

Further, the CAFC, in In re Oetiker, 977 F.2d 1443, 1447; 24 USPQ2d 1443, 1445 (CAFC 1992) held:

There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge can not come from the applicant's invention itself.

The CAFC again reaffirmed the criteria for obviousness in In re Fritch, 972 F.2d 1260, 1266; 23 USPQ 2d 1780, 1783-1784 (Fed. Cir. 1992), where the court said:

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so.

The court went on to say that "It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious."

While the nonelectrolytic cleaning disclosed by Sachdev '527 and Sachdev '799 and the electrolytic cleaning for soil and smut removal as disclosed by Spring are well known, Appellants

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suggest that the Examiner has shown no motivation as to why one skilled in the art would want to combine Spring with Sachdev '527 or Sachdev '799 since Sachdev '527 and Sachdev '799 on the one hand and Spring on the other apparently work well by themselves. While the Examiner did generally state that the combination was obvious to "enhance the cleaning and to reduce the fuming" (fuming is not actually an issue here), the Examiner did not point to any reason, teaching or suggestion in the prior art that would support the combination.

Further, all of Sachdev '527, Sachdev '799 and Spring involve the inherently unpredictable chemical arts. Thus, just because Sachdev '527 or Sachdev '799 and Spring can be combined doesn't mean that they should be combined. Sachdev '527 and Sachdev '799 both relate to the aqueous nonelectrolytic cleaning of paste residue from metal masks while Spring relates to the removal of oily soil and smut. Due to the inherently unpredictable nature of the chemical arts, it cannot be assumed that the mere combination of such disparate references will produce any new or different results or, for that matter, will even work. Moreover, the Examiner has not provided any rationale or motivation to indicate why such disparate references in such inherently unpredictable chemical arts should be combined.

Lastly, Appellants have demonstrated in the various examples that vastly superior, surprising and unexpected results occur with the electrolytic cleaning of the present invention. For example, the time to ultrasonically clean a mask using a 0.8 weight percent TMAH solution was dramatically reduced from 100 seconds to just 20 seconds using electrolytic cleaning according to the present

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invention.

The Examiner in considering these unexpected results stated:

The applicants state that the method of the invention provides unexpected results. This is not persuasive because Spring teaches that electrocleaning enhances the chemical cleaning in several ways. See pages 67-73, especially second paragraph on page 67. An ordinary artisan would have reasonably expected that electrocleaning would significantly enhance the cleaning results.

However, such a response from the Examiner does not comport with the case law. In In re Soni, 54 F.3d 746; 34 USPQ2d 1684 (Fed Cir. 1995), the court was considering the patentability of a melt-processed polymer composition having a molecular weight in excess of 150,000. The Examiner there cited prior art which disclosed the precise melt-processed polymer composition but was otherwise silent on the molecular weight. Other references disclosed melt-processed polymers in the claimed molecular weight range. The Examiner and the Board did not seriously consider the Applicant's (Soni's) evidence of unexpected results. The court stated:

Mere improvement in properties does not always suffice to show unexpected results. In our view, however, when an applicant demonstrates *substantially* improved results, as Soni did here, and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence* of evidence to the contrary. Soni, who owed the PTO a duty of candor, made such a showing here. The PTO has not provided any persuasive basis to question Soni's comparative data and assertion that the demonstrated results were unexpected. In re Soni, 54 F.3d at 751; 34 USPQ2d at 1688.

The court went on to reverse the PTO's rejection of the claims.

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Appellants suggest that In re Soni is on point here. Appellants provided evidence of unexpected results and in their initial response to the Examiner's rejection of the claims indicated that the results were unexpected. However, the Examiner has never rebutted such unexpected results.

For all of the above reasons, it is submitted that the Examiner has failed to state a prima facie case of obviousness with respect to claim 1.

Inasmuch as claims 2 to 16 depend, directly or indirectly, from claim 1, and claim 1 is believed to be patentable, then claims 2 to 16 should be patentable as well. In addition, claim 7 is believed to be independently patentable as well.

**B. Patentability of Claim 7**

While claim 1 pertained to electrolytic cleaning alone, claim 7 combines nonelectrolytically cleaning with electrolytically cleaning. There is no motivation shown by the Examiner as to why one skilled in the art would want to combine Spring with Sachdev '527 or Sachdev '799 since Sachdev '527 and Sachdev '799 apparently work well by themselves and thus there would appear to be no reason, suggestion or teaching in Sachdev '527 or Sachdev '799 or Spring that it would be desirable to further improve their nonelectrolytic cleaning process by combining an electrolytic cleaning step.

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In addition, all of Sachdev '527, Sachdev '799 and Spring involve the inherently unpredictable chemical arts. Both of Sachdev '527 and Sachdev '799 relate to the aqueous nonelectrolytic cleaning of paste residue from metal masks while Spring relates to the removal of oily soil and smut. Due to the inherently unpredictable nature of the chemical arts, it cannot be assumed that the mere combination of such disparate references will produce any new or different results or, for that matter, will even work.

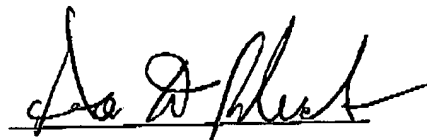
Finally, Appellants have demonstrated in the various examples that vastly superior and unexpected results occur with the electrolytic cleaning of the present invention. The Examiner has never rebutted those unexpected results. Accordingly, claim 7 should be considered to be patentable.

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In view of all of the preceding remarks, it is submitted that claims 1 to 16 are in condition for allowance, that the Examiner's various rejections of claims 1 to 16 are erroneous and reversal of the Examiner's decisions is respectfully requested.

Respectfully Submitted,

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1. A process for cleaning paste residue from a workpiece comprising the steps of obtaining a workpiece having a paste residue thereon and electrolytically contacting the workpiece with an aqueous solution containing 0.2 to 2 weight percent TMAH.
2. The process of claim 1 wherein the step of electrolytically contacting comprises spraying the workpiece with the aqueous solution.
3. The process of claim 1 wherein the step of electrolytically contacting comprises immersing the workpiece in the aqueous solution.
4. The process of claim 1 wherein the aqueous solution in the step of electrolytically contacting is maintained at a temperature of 25 to 80 °C.
5. The process of claim 1 wherein the aqueous solution in the step of electrolytically contacting is maintained at a temperature of 70 °C.

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6. The process of claim 1 wherein the aqueous solution in the step of electrolytically contacting contains 0.4 to 0.5 weight percent TMAH.

7. The process of claim 1 further comprising the step, prior to the step of electrolytically contacting, of nonelectrolytically contacting the workpiece with an aqueous solution containing 0.2 to 2 weight percent TMAH.

8. The process of claim 7 wherein the step of nonelectrolytically contacting comprises spraying the workpiece with the aqueous solution.

9. The process of claim 7 wherein the step of nonelectrolytically contacting comprises immersing the workpiece in the aqueous solution.

10. The process of claim 7 wherein the aqueous solution in the step of nonelectrolytically contacting is maintained at a temperature of 25 to 80 °C.

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11. The process of claim 7 wherein the aqueous solution in the step of nonelectrolytically contacting is maintained at a temperature of 70 °C.

12. The process of claim 1 wherein the workpiece is a screening mask.

13. The process of claim 1 wherein the paste comprises solder.

14. The process of claim 1 wherein the paste comprises at least one metal selected from the group consisting of molybdenum, copper, tungsten, nickel, gold, palladium, platinum and silver.

15. The process of claim 1 wherein the paste residue comprises an inorganic material selected from the group consisting of ceramic and glass.

16. The process of claim 1 wherein the paste comprises a polymeric binder.

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**EVIDENCE APPENDIX**

**COPIES OF REFERENCES CITED BY THE EXAMINER TO FOLLOW**

Sachdev et al. U.S. Patent 6,277,799

Sachdev et al. U.S. Patent 6,280,527

Samuel Spring, Metal Cleaning, pp. 67-73 (1963)

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**RELATED PROCEEDINGS APPENDIX**

**NO RELATED PROCEEDINGS**